



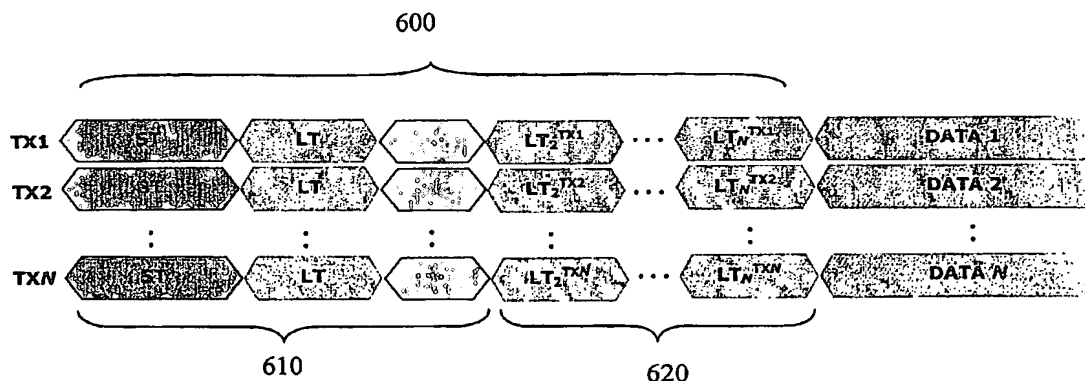
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(54) Title: METHODS AND APPARATUS FOR BACKWARDS COMPATIBLE COMMUNICATION IN A MULTIPLE ANTENNA COMMUNICATION SYSTEM USING TIME ORTHOGONAL SYMBOLS



(57) Abstract: A method and apparatus are disclosed for transmitting symbols in a multiple antenna communication system according to a frame structure, such that the symbols can be interpreted by a lower order receiver (i.e., a receiver having a fewer number of antennas than the transmitter). The disclosed frame structure comprises a legacy preamble having at least one long training symbol and N-1 additional long training symbols that are transmitted on each of N transmit antennas. The legacy preamble may be, for example, an 802.11 a/g preamble that includes at least one short training symbol, at least one long training symbol and at least one SIGNAL field. A sequence of each of the long training symbols on each of the N transmit antennas are time orthogonal. The long training symbols can be time orthogonal by introducing a phase shift to each of long training symbols relative to one another.